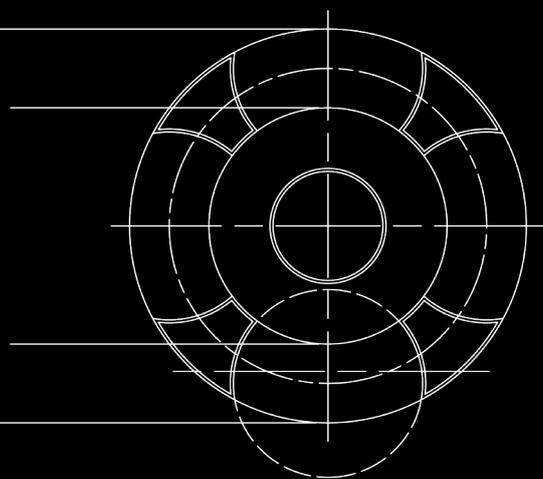




GIUNTI SERIE GIFLEX GE-T

Appendice Tecnica





INTRODUCTION

Flexible torsion couplings, which are connecting devices between rotating shafts, are designed to ensure shock-free torque transmission and to compensate minor alignment deviations in operation between the shafts in industrial use.

The GE-T range of flexible couplings ensures this level of performance and also provides excellent quality thanks to the machining accuracy and the choice of materials.

The general level of reliability provided by the GE-T couplings results in a long life operation.



GENERAL

The GE-T range of flexible couplings represents torsionally flexible mechanical couplings capable of transmitting a twisting moment proportional to the flexible yield of the intermediate component. The couplings must be capable of effectively absorbing possible torsional vibrations due to the load or self-induced, to attenuate impacts and torque peaks during the start-up phase and to compensate minor angular and parallel misalignments between the shafts, however ensuring an acceptable useful working life.

These features and more in general the performance required from the coupling depend almost exclusively on the quality intermediate component.

The choice of the material used to manufacture the coupling is therefore fundamental. The curve that expresses the flexible characteristic of the intermediate component must have a progressive trend (yielding at low torque values and remaining rigid at higher torque values) to ensure operation without jerks at start-up and with a limited torsional yield at steady state conditions.

It is essential for the intermediate component to have a certain flexible hysteresis, proportional to the required absorbing effect that ensures the coupling can efficiently absorb possible torsional oscillations.

Furthermore, the useful working life of the coupling depends on the flexible yield of the material comprising the intermediary component. The physical characteristics has described above are frequently in contrast with each other and compared with other basic mechanical and technological parameters. The performance of the intermediary component therefore cannot be adapted to the variety of operating conditions when only one type of material is used and therefore the materials adopted for the flexible ring gear must be differentiated.

A selected thermoplastic elastomer is selected to meet medium level needs in the basic execution. This refers to an elastomer with medium rigidity, characterised by an optimum internal dampening effect, resistant to ageing, to fatigue, to abrasion, as well as hydrolysis and to the principle chemical agents with special reference to oils and ozone. Operating temperatures lying between -40 °C and + 125 °C with brief peaks of up to 150 °C are permitted in the case of couplings in the base execution. Alternative mixes capable of meeting every practical need have been designed and are available on request for use in extremely demanding operating conditions, or for needs that exceed average requirements.

OPERATING AND ASSEMBLY CONDITIONS

Operation of the flexible torsion couplings, such as the GE-T type or similar couplings is characterized by a proportional feature between the twisting torque and the torsion angle and by the ability to compensate limited angular and radial misalignments.

Key features of equal importance, but which are more difficult to interpret are represented by the absorbing factor and natural frequency or resonance.

To qualify its couplings, Chiaravalli Trasmissioni SpA declares permitted twisting torque values correlated to well defined torsion angle values, which has the limiting value of 5 ° C corresponding to the maximum torque value. This provides a valid guide for the progressive characteristic of the flexible curve. The maximum permitted values are shown in the case of the angular and radial misalignments, with the warning that these refer to extreme values that cannot be added together (only angular compensation or only radial compensation) and apply to standard operating conditions characterised by the following: operating torque not exceeding the nominal torque, a rotating speed of less than 1,450 r.p.m and coupling temperature not exceeding 40° C.

The maximum rotating speed expressed in r.p.m that corresponds to maximum peripheral speed of 30 m/sec. is indicated for each coupling of the GE-T range.

This speed can be achieved with a sufficient safety margin compared to the danger of failure due to centrifugal force stress thanks to the characteristics of the material used.

Class G 2.5 dynamic balancing in compliance with ISO 1940 is recommended despite the fact that the half-couplings are fully machined on both external surfaces, if the actual operating speed exceeds 2.800 r.p.m.

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COUPLING SELECTION AND SIZING CRITERION

Couplings are sized on the basis of the physical laws of mechanics and the resistance of the materials and also complies on the provisions established in the DIN 740 standards. the coupling is selected on the basis of the criterion, which establishes that the maximum permitted stress is never exceeded even in the most demanding operating conditions. It follows that the nominal torque declared for the coupling must be compared with a reference torque that takes into account the overloads due to the way the load is exerted and the operating conditions. The reference torque is obtained by multiplying the operating torque by a series of multiplying factors depending on the nature of the load or on the ambient temperature conditions.

LOAD DUE TO NOMINAL TORQUE

The permitted nominal coupling torque TKN must apply for any operating temperature value equal to or greater than the driven side operating torque TLN.

$$TKn = 9549 \frac{(PLn) [Nm]}{nLn}$$

The following condition must be satisfied, where St represents the temperature factor, to take into account overloads due to the operating temperature for the coupling.

$$TKn > TLN * St$$

START - UP LOAD

The drive motor delivers a drive torque during the start-up transient period which is a multiple of the nominal torque and depends on the way the masses are distributed. A similar situation occurs in the braking phase therefore, this two phases are characterised by torque impacts that have an intensivity which depends on the distribution of the masses on the drive side MA and on the driven side ML, as well as the frequency of the number of start – ups on which the start – up factor Sz depends. The static torques for the drive side and the driven side are expressed by the following relationships:

- drive side $TS = TAS * MA * SA$

- driven side $TS = TLS * ML * SL$

MA and ML are assumed to be equal to 1, to first approximation, and if the distribution of the masses is unknown. The SA factor can be assumed as being equal to the relationship between the start – up torque and the nominal torque in the case of drives based on an electric motor.

LOAD CAUSED BY TORQUE IMPACTS

The permitted nominal coupling torque TKN max must be equal to or greater than the start-up torque increased by the temperature factor and by St and by the start-up factor Sz for any operating temperature value.

$$TKn_{max} > TS * St * Sz$$

Consult the CHIARAVALLI Trasmissioni Technical Department for operating conditions that foresee periodic variation or torque inversions, as well as alternate torsional stresses.

SYMBOLS

- Tk n** = coupling maximum torque (Nm)
- Tk max** = coupling maximum torque (Nm)
- Tk w** = torque with coupling inversion (Nm)
- TLN** = driven side operating torque (Nm)
- TLs** = driven side static torque (Nm)
- TAs** = motor side static torque (Nm)
- Ts** = plant static torque (Nm)
- PLn** = driven side operating power (Nm)
- nLn** = driven side rotating speed (r.p.m)
- St** = temperature factor
- JA** = inertia moment drive site
- JL** = exit side
- SA** = motor side impact factor
- SL** = driven side impact factor
- Sz** = start-up factor

MA = control side mass factor $\frac{JL}{JA + JL}$

ML = driven side mass factor $\frac{JA}{JA + JL}$

INDICATIVE VALUES FOR ADJUSTMENT FACTORS:

Name	Symbol	Definition				
		St.	1	1	1,4	1,8
Temperature factor	St.	C°	-30°	+40°	+80°	+120°
			+30°			
			Number of start-ups per hour			
Start-up factor	Sz.	Start-up/hr	100	200	400	800
		Sz.	1	1,2	1,4	1,6
Impact factor	SA/SL					SA/SL
		minor start-up impacts				1,5
		medium start-up impacts				1,8
		major start-up impacts				2,2

SERVICE FACTORS:

Load condition	Operating conditins	Type of Drive	
		Electric motor	Diesel engine
UNIFORM	Regular operation without impacts or overloads	1,25	1,50
LIGHT	Regular operations with minor and infrequent impacts and overloads	1,50	2,00
MEDIUM	Irregular operation with medium overloads for a short duration and frequent but moderate impacts	2,00	2,50
HEAVY	Markedly irregular operation with very frequent impacts and overloads and of major intensity	2,50	3,00

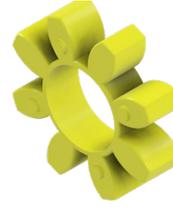
CHIARAVALLI GROUP BRAND GIFLEX®

AXIS MISALIGNMENTS COMPENSATED WITH COUPLING GE-T



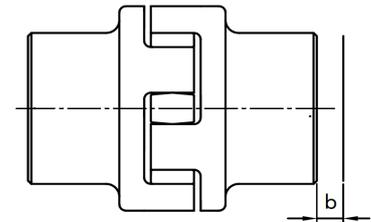
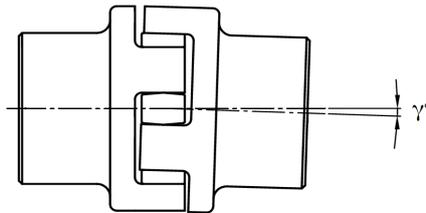
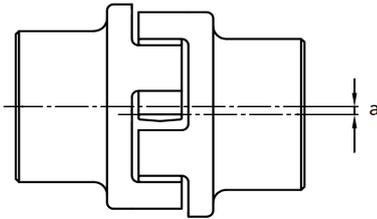
TECHNICAL DATA

Spider for GE-T	
Employment temperature	
- Black	-40° +140°
- Yellow	-40° +90°
- Red	-30° +90°
- Green	-30° +110°



BLACK SPIDER 92-94Sh A THERMOPLASTIC YELLOW SPIDER 92-94Sh A POLYURETHAN RED SPIDER 96-98 Sh A POLYURETHAN GREEN SPIDER 64 Sh D POLYURETHAN

TECHNICAL DATA



TECHNICAL DATA

SPIDER TYPE	MAX R.p.M.	SPIDER	COLOR	TORSION ANGLE		TORQUES (Nm)			Torsional rigidity (NMrad)				displacement											
				Tk n	tk MAX	Norm.	Max	with invers.	1.0	0.75	0.5	0.25	axial	radial	angular									
																TkN	Tk MAX	Tk w	Tk n	Tk n	Tk n	Tk n	b (mm)	a (mm)
GE-T 19-24	1400	92/94 Sh a	BLACK	3°	5°	10	20	2,6	1280	1050	800	470	1,2	0,2	1,2°									
		92/94 Sh a	YELLOW			17	34	4,4	2920	2390	1810	1070												
		96/98 Sh a	RED													21	42	5,5	5350	4390	3320	1970		
		64 Sh D	GREEN																				35	70
92/94 Sh a	BLACK	60	120										16	9930	8140									
92/94 Sh a	YELLOW					75	150	19,5	15110	12390	9370	5950												
96/98 Sh a	RED															95	190	25	10900	8940	6760	4010		
64 Sh D	GREEN																						160	320
92/94 Sh a	BLACK	200	400										52	27520	22570									
92/94 Sh a	YELLOW					190	380	49	21050	17260	13050	7740												
96/98 Sh a	RED															325	650	85	48570	39830	30110	17850		
64 Sh D	GREEN																						405	810
92/94 Sh a	BLACK	265	530										69	23740	19470									
92/94 Sh a	YELLOW					450	900	117	54500	44690	33790	20030												
96/98 Sh a	RED															560	1120	145	79860	65490	49520	29350		
64 Sh D	GREEN																						310	620
92/94 Sh a	BLACK	525	1050	137	65290								53540	40480	24000									
92/94 Sh a	YELLOW					655	1310	170	95510	78320	59220	35100												
96/98 Sh a	RED															410	820	105	50720	41590	31450	18640		
64 Sh D	GREEN																						625	1250
92/94 Sh a	BLACK	825	1650	215	107920								88500	66910	39660									
92/94 Sh a	YELLOW					625	1250	163	97130	79650	60220	35700												
96/98 Sh a	RED															940	1880	166	129510	106200	80300	47600		
64 Sh D	GREEN																						1175	2350
92/94 Sh a	BLACK	1250	2500	330	113320								92920	70260	41650									
92/94 Sh a	YELLOW					1910	3850	490	197500	161950	122450	72580												
96/98 Sh a	RED															2410	4820	624	248220	203540	153900	91220		
64 Sh D	GREEN																						2400	4800
92/94 Sh a	BLACK	3600	7200	936	312200								256000	193560	114730									
92/94 Sh a	YELLOW					4500	9000	1170	674520	553110	418200	247890												
96/98 Sh a	RED															3,4	0,5	1,2°						
64 Sh D	GREEN																							

with radial speed more than v=30m/s dynamic balancing is needed

EXAMPLE SPIDER CODE: 0200 24 14 → 010 BLACK
 012 YELLOW
 013 GREEN
 014 RED

↓ TYPE
 SPIDER GE-T

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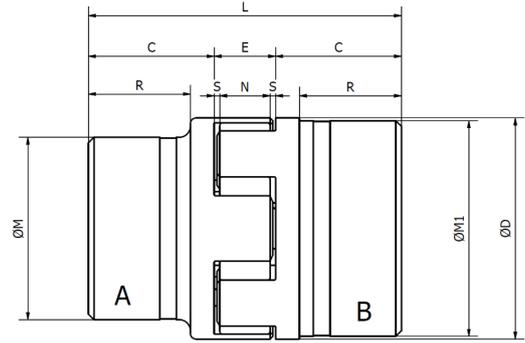
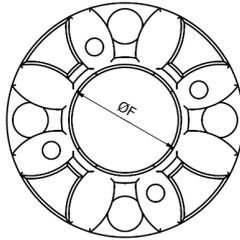


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GE-T SERIES WITH ELASTIC SPIDER - ACCURATE DESIGN

TECHNICAL DATA

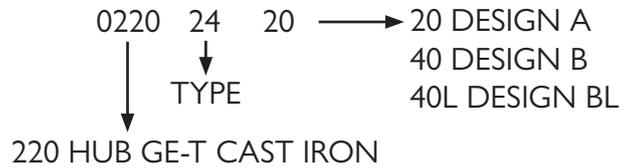
CAST IRON GG 25



COUPLING TYPE	Ø BORE		Ø MAX BORE ALLOWED		DIMENSIONS											
					A-B										BL	
					A max	B/BL max	C	ØD	E	ØG	ØM	ØM1	N	R	S	L
GE-T 19A-24B*	-	-	19	24	25	40	16	18	30	40	12	19	2	66	37	31
GE-T 24A-32B	-	-	24	32	30	55	18	27	40	55	14	24	2	78	50	44
GE-T 28A-38B	-	-	28	38	35	65	20	30	48	65	15	27,5	2,5	90	60	52,5
GE-T 38A-45B	-	-	38	45	45	80	24	38	66	78	18	36,5	3	114	70	61,5
GE-T 42A-55B	-	-	42	55	50	95	26	46	75	94	20	40	3	126	75	65
GE-T 48A-60B	-	-	48	60	56	105	28	51	85	104	21	45	3,5	140	80	69
GE-T 55A-70B	-	-	55	70	65	120	30	60	98	118	22	52	4	160	90	88
GE-T 65A-75B	-	-	65	75	75	135	35	68	115	134	26	61	4,5	185	100	86
GE-T 75A-90B	-	-	75	90	85	160	40	80	135	158	30	69	5	210	110	97
GE-T 90A-100B	38	38	90	100	100	200	45	100	160	180	34	81	5,5	245	125	106

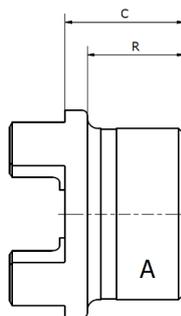
COUPLING TYPE	WEIGHT Kg				J Kg cm ² mozzi
	SPIDER elastico	HUB A	HUB B	HUB BL	
GE-T 19A-24B*	0,004	0,18	0,25		0,8
GE-T 24A-32B	0,014	0,36	0,55		3
GE-T 28A-38B	0,025	0,6	0,85		7
GE-T 38A-45B	0,042	1,35	1,65		20
GE-T 42A-55B	0,066	2	2,3		50
GE-T 48A-60B	0,088	2,75	3,1		80
GE-T 55A-70B	0,116	4,2	4,5		160
GE-T 65A-75B	0,172	6,5	6,8		310
GE-T 75A-90B	0,325	10	10,8		680
GE-T 90A-100B	0,44	14	15,8		1590

EXAMPLE HUB CODE:

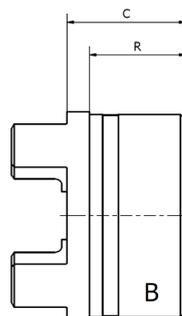


J Inertia moment hub A+B with max bore allowed

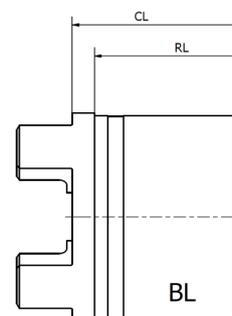
MAT. C45 EN 10083
 MAT CAST IRON G20/25 EN 1561



DESIGN A



DESIGN B



DESIGN BL

NEW

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ALUMINIUM ALLOY

INTERPRETATION CODES

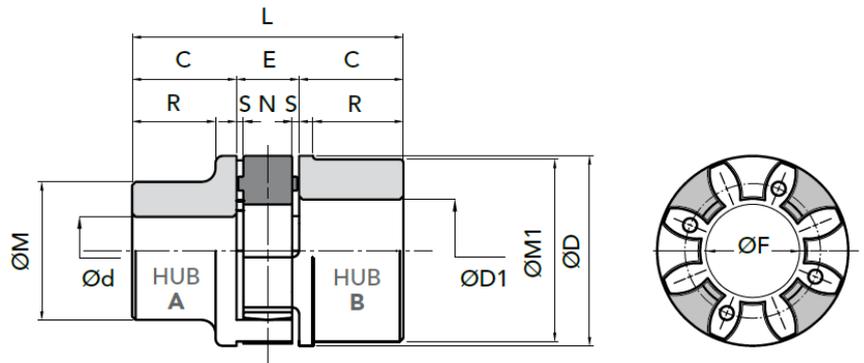
EXAMPLE

GE-T 19A-24B/AI = HUB A + HUB B

GE-T 19A-19A/AI = 2 hubs A

GE-T 24B-24B/AI = 2 hubs B

The characteristic size of the coupling is defined by the maximum diameter bore.



PART NUMBERS

COUPLING TYPE	PART NUMBER	PART NUMBER
	HUB A	HUB B
GE-T 19A-24B/AI	02301920	02301940
GE-T 24A-32B/AI	02302420	02302440
GE-T 28A-38B/AI	02302820	02302840
GE-T 38A-45B/AI	02303820	02303840

MEASUREMENTS - WEIGHTS

COUPLING TYPE	Ø pilot bore		Ø finished bore		measurement in mm normal range										Weight Kg			J Kg cm ² hubs A+B
	A	B	Ød max	ØD1 max	C	ØD	E	ØF	ØM	ØM1	N	R	S	L	spider	HUB		
																A	B	
GE-T 19A-24B/AI	6	10	19	24	25	40	16	18	30	40	12	19	2	66	0,005	0,07	0,08	0,4
GE-T 24A-32B/AI	8	14	24	32	30	55	18	27	40	55	14	24	2	78	0,014	0,13	0,18	1
GE-T 28A-38B/AI	10	16	28	38	35	65	20	30	48	65	15	27,5	2,5	90	0,025	0,22	0,3	3
GE-T 38A-45B/AI	12	20	38	45	45	80	24	38	66	78	18	36,5	3	114	0,042	0,48	0,55	8

J inertia torque HUB A+B with bore max Ø



CHIARAVALLI GROUP BRAND GIFLEX®

GE-T SERIES WITH ELASTIC SPIDER - ACCURATE DESIGN

CAST-IRON GG25

with **TAPER BUSH® LOCK**

INTERPRETATION CODES

EXAMPLE

GE-T 28I-38E = HUB I + HUB E

GE-T 28E-38I = HUB E + HUB I

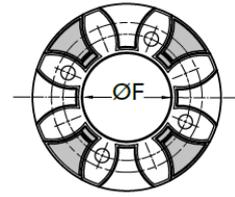
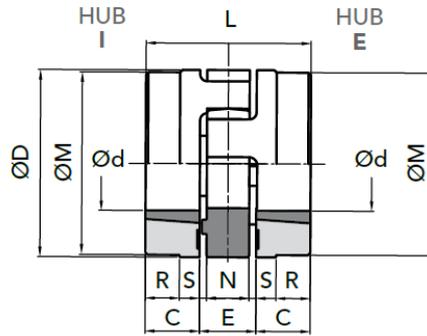
GE-T 28I-28I = 2 hubs I

GE-T 38E-38E = 2 hubs E

Insertion bush:

HUB **I** with internal assembled bush

HUB **E** with external assembled bush



PART NUMBERS FOR COMPLETE COUPLINGS

COUPLING TYPE	PART NUMBER	PART NUMBER
	HUB I	HUB E
GE-T 28-38 TL	03202841	03202840
GE-T 38-45 TL	03203841	03203840
GE-T 42-55 TL	03204241	03204240
GE-T 48-60 TL	03204841	03204840
GE-T 55-70 TL	03205541	03205540
GE-T 75-90 TL	03207541	03207540

MEASUREMENTS - WEIGHTS

COUPLING TYPE	Ø pilot bore	finished bore		measurement in mm normal range									Weight Kg		J Kg cm ² hubs
		Ød max	ØD1 max	C	ØD	E	ØF	ØM	N	S	L	R	spider	HUB bore max	
GE-T 28-38 TL	1108	14	25	23	65	20	30	65	15	2,5	66	-	0,025	0,50	7
GE-T 38-45 TL	1108	14	25	23	80	24	38	78	18	3	70	15	0,042	0,88	26
GE-T 42-55 TL	1610	14	42	26	95	26	46	94	20	3	78	16	0,066	1,40	36
GE-T 48-60 TL	1615	19	40	39	105	28	51	104	21	3,5	106	28	0,088	2,33	78
GE-T 55-70 TL	2012	19	50	33	120	30	60	118	22	4	96	20	0,116	2,42	120
GE-T 75-90 TL	2517	19	65	57	160	40	80	158	30	5	154	41	0,325	6,80	630